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10/702,348

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Earl C. Johns

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EXAMINER

OLSON, JASON C

ART UNIT

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2627

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                               |                              |  |
|------------------------------|-------------------------------|------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/702,348 | Applicant(s)<br>JOHNS ET AL. |  |
|                              | Examiner<br>Jason C. Olson    | Art Unit<br>2627             |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-14 and 16-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-14 and 16-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-8, 13, 14, 16-18 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (U.S. Pat. 5,886,922), hereafter "Saito" in view of Khizroev et al. (U.S. Pub. 2002/0109947), hereafter, "Khizroev".

Regarding claim 1, Saito teaches a read electrode configured to carry an electrical charge of a first charge polarity orientation proximate a ferroelectric domain of the ferroelectric storage medium which has a second charge polarity orientation; and wherein the ferroelectric domain changes polarity and an electrical readback current flows in the read electrode when the first charge polarity orientation and the second charge polarity orientation are opposite (see col. 8, ln. 46-65, the conductive needle is a read electrode). Saito fails to teach a shield which extends around the read electrode arranged to reduce noise sensed by the read electrode and increase spatial resolution of the read electrode. However, Khizroev is relied upon to teach a shield which extends around the read electrode arranged to reduce noise sensed by the read electrode and increase spatial resolution of the read electrode (see figure 5 and corresponding description: magnetic shield 34 extends around read element 32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the read element of

Saito by applying the teaching of a shield that extends around the read element as taught by Khizroev for the purpose of reducing interference while reading.

Regarding claim 3, the combination of Saito and Khizroev teaches a write electrode proximate the read electrode, configured to apply an electric field to the ferroelectric medium to thereby impress an electrical polarization on ferroelectric domains of the ferroelectric medium; and wherein the write electrode trails the read electrode and is configured to impress the second charge polarity on the ferroelectric domain following a read operation in which the charge polarity of the ferroelectric domain was changed (see col. 7, ln. 49-col. 8, ln. 4, col. 8, ln. 63-65, col. 9, ln. 49-58, and figure 1 of Saito; it is obvious to an artisan in the art that a second electrode in the array, proximate the first electrode, shown in figure 1, is positioned with the X-Y control mechanism to rewrite the destroyed data, following a read operation).

Regarding claim 4, the combination of Saito and Khizroev teaches a second shield which extends between the read electrode and the write electrode (see col. 10, ln. 1-14 and figures 1 and 2 of Saito; the insulation layer 1B is a shield that extends between a first probe, read probe and a second probe, write probe in the array).

Regarding claim 5, the combination of Saito and Khizroev teaches the write electrode and read electrode are carried in a dielectric material (see figures 1 and 2 and corresponding description of Saito; the electrodes 22 are carried in an insulation layer b, which is a dielectric material).

Regarding claim 6, the combination of Saito and Khizroev teaches a controller configured to apply the electrical charge to the read electrode and sense the readback current (see

col. 8, ln. 46-65 and col. 9, ln. 49-58 of Saito; the W/R circuitry controls the electrical charge to the read/write electrode and senses the readback current).

Regarding claim 7, the combination of Saito and Khizroev teaches a controller configured to apply a charge to the write electrode following a read operation in which the charge polarity of the ferroelectric domain was changed (see col. 7, ln. 49-col. 8, ln. 4, col. 8, ln. 63-65, col. 9, ln. 49-58, and figure 1 of Saito; it is obvious to an artisan in the art that a second electrode in the array, shown in figure 1, is positioned with the X-Y control mechanism and controlled via the W/R circuit 31 to rewrite the destroyed data, following a read operation).

Regarding claim 8, the combination of Saito and Khizroev teaches a ferroelectric transducer configured to move relative to a storage medium having a surface of a ferroelectric material (see col. 8, lns. 5-11 and 52-58 of Saito).

Regarding claim 13, claim 13 has limitations similar to those treated in the above rejection(s), and is met by the references as discussed above. Claim 13 however also recites the following limitations as taught by the combination of Saito and Khizroev: an array of ferroelectric transducers (see col. 9, ln. 49-53 and figure 1 of Saito); and an actuator configured to move the storage medium relative to the array (see col. 8, ln. 5-14 and figure 4 of Saito; actuator 91).

Regarding claims 14, 16-18, and 24: method claims 14, 16-18, and 24 are drawn to the method of using the corresponding apparatus claimed in claims 1, 3-8 and 13. Therefore method claims 14, 16-18, and 24 correspond to apparatus claims 1, 3-8 and 13 and are rejected for the same reasons of obviousness as used above.

Regarding claims 25-28: Claims 25-28 have limitations similar to those treated in the above rejection(s), and are met by the references as discussed above.

Claims 9, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito and Khizroev as applied to claims 8 and 14 above, and further in view of Onoe et al (U.S. Pat. 7,221,639), hereafter "Onoe".

Regarding claim 9, Saito and Khizroev fail to teach a transducer is carried on a slider proximate the surface, however, Onoe is relied upon to teach a ferroelectric transducer carried on a slider proximate a ferroelectric surface (see col. 7, ln. 59-65 and figures 1A and 1B; the ferroelectric transducer 11 is carried on a slider 52 proximate a ferroelectric surface 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the ferroelectric storage system of Saito and Khizroev by applying the teaching of a ferroelectric transducer being carried on a slider proximate a ferroelectric surface as taught by Onoe, the reason being that the slider flies above the surface in close proximity and follows the topography of the surface.

Regarding claims 19 and 20: method claims 19 and 20 are drawn to the method of using the corresponding apparatus claimed in claim 9. Therefore method claims 19 and 20 correspond to apparatus claim 9 and are rejected for the same reasons of obviousness as used above.

Claims 10-12 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito, Khizroev, and Onoe as applied to claims 9 and 20 above, and further in view of Fong et al. (U.S. Pub. 2005/0044695), hereafter "Fong".

Regarding claims 10-12, Saito, Khizroev, and Onoe fail to teach a slider configured to wear until an equilibrium is reached during operation, the slider includes a trim region proximate a trailing edge of the slider, and the transducer is positioned proximate the trim region, whereby the trim region is positioned between the transducer and the trailing edge of the slider. However, Fong is relied upon to teach a trim region (figure 1, item 102) proximate the trailing edge of the slider (figure 1, item 100) that is positioned between the transducer (figure 1, item 104) and the trailing edge such that the slider contacts the disk at initial stages in order to wear off from the trailing edge of the ABS surface (see paragraph [0006]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to improve upon the storage system of Saito, Khizroev, and Onoe by applying the teaching of wearing a trim region of the slider as taught by Fong for the reasons given in paragraph [0006].

Regarding claims 21-23: method claims 21-23 are drawn to the method of using the corresponding apparatus claimed in claims 10-12. Therefore method claims 21-23 correspond to apparatus claims 10-12 and are rejected for the same reasons of obviousness as used above.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 13, 14, and 25 have been considered but are moot in view of the new ground(s) of rejection. Claims 1, 3-8, 13, 14, 16-18 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Khizroev. Claims 9,

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19. and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito and Khizroev as applied to claims 8 and 14, and further in view of Onoe. Claims 10-12 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito, Khizroev, and Onoe as applied to claims 9 and 20 above, and further in view of Fong.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Drees et al. (U.S. Pat. 3,806,902) is cited for magnetic head read-to-write gap crossfeed shielding.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason C. Olson whose telephone number is (571)272-7560. The examiner can normally be reached on Monday thru Thursday 7:30-5:30; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (571)272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Korzuch/  
SPE, Art Unit 2627